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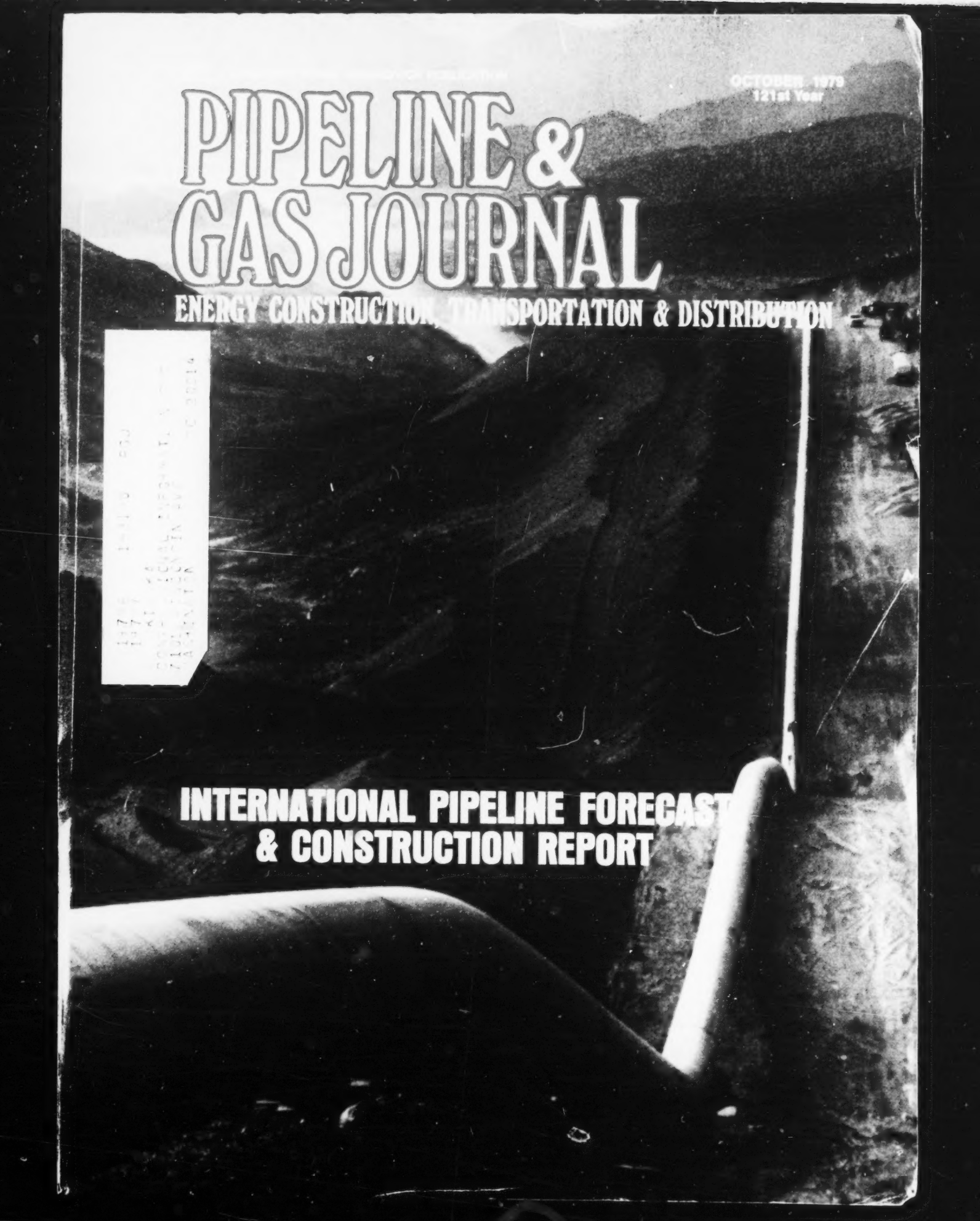

INTERNATIONAL PIPELINE FORECAST & CONSTRUCTION REPORT

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THE COVER

Working across western Saudi Arabia's Hejaz mountain region, pipeliners joint the 48-in. Petroline oil line on its way from eastern fields to the new terminal at Yanbu.

—*Photo courtesy CAT-Houston*

World Pipeline Construction, Planning, Tops 100,000 Miles 19
Energy demand is up around the world, and so is the need for new oil and gas pipelines: total miles planned/underway has risen 5.7%, with natural gas lines accounting for 54.5% of that mileage, crude oil lines for 25.5%, products lines for 17.5%, and slurry lines for 2.7%.

Petroline's Giant Crude Line Inching Across Saudi Arabia 24
Construction progresses smoothly on the 1200-km, 48-in. east-to-west crude oil line linking fields near Abqaiq to the new port facilities at Yanbu on the Red Sea.

Petrobras Oil Line Laid Through Difficult Terrain 30
"Ambel" pipeline, installed by Techint Engineering Co., is a new, 358-km system to move Brazilian crude oil from the Torgua tank farms, near Rio de Janeiro, to a refinery in Belo Horizonte, Minas Gerais.

China's Gas Industry A Sleeping Giant 40
Natural gas history began there, but China's gas industry is small, and there is much uncertainty about its future—despite a potential for its ranking near the top. In an exclusive article, A.G.A. chairman John Kean reports on his delegation's visit to the Peoples Republic of China.

Mexico Plans 2979 Miles Of Pipelines 48
Vigorous economic development is matched by Mexico's push to utilize energy made available by its expanding oil and gas industry—which means stepped-up construction of crude oil, refined products, and natural gas pipeline systems.

56-Inch Submarine Pipeline Laid Off Okinawa 58
Five underwater lines installed from seaberth to central terminal station on Okinawa included 56- and 44-in. oil lines, 30-in. ballast line, and two smaller pipe sections; NKK's *Kokan Pioneer I* laid the system in three groups.

Epoxy-Coated Pipe In U.K. Has Contractor Okay 63
British Gas Corp.'s new 42-in. epoxy coated pipe test section points out advantages to contractors—including faster laying rates, improved cost economics, and ensured health and safety.

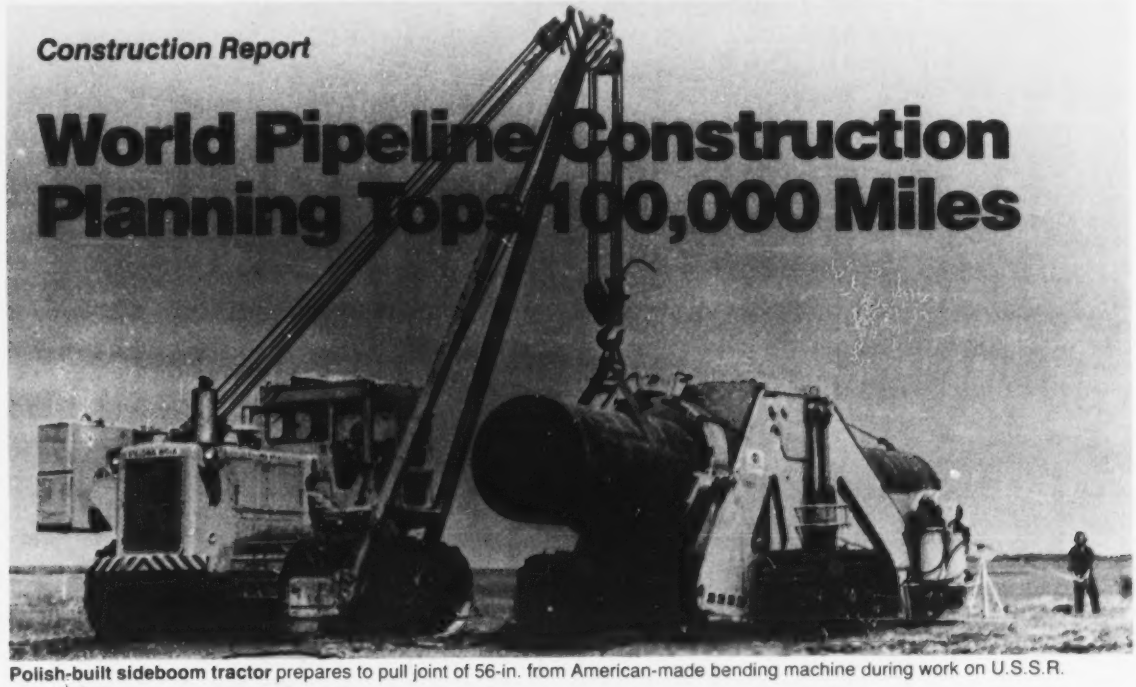
U-Gas Plant Planned For Memphis 70
New method of converting coal to high-Btu gas that employs a simple design and safe, reliable operation will be used in demonstration plant planned for Shelby County, Tenn., under sponsorship of Memphis Light, Gas and Water, and Department of Energy.

Sicilian Channel Crossing Underway 77
Triple 20-in. crossing of the Sicilian Channel for Trans Mediterranean Pipeline kicked-off with initiation of landfall sections in Tunisia.

Diver-Operated Undersea Trencher Developed 82
Trenching machine cuts and installs pipe in a single, one-man operation and has been successfully used 470 ft beneath the surface of the North Sea.

Construction Report

World Pipeline Construction Planning Tops 100,000 Miles



Polish-built sideboom tractor prepares to pull joint of 56-in. from American-made bending machine during work on U.S.S.R. gas pipeline.

by Dean Hale, *Editor*

Over $110 billion will be spent to build more than 100,000 miles of pipelines now planned or underway around the world (outside the United States), according to PIPELINE & GAS JOURNAL's survey of the world pipeline scene. As of September, 1979, there were 100,597 miles of natural gas, crude oil, refined products, and slurry pipelines either planned or actually under construction. Excluding 5867 miles of such pipelines in Iran, the world total is 94,730 miles. The total includes 18,212 miles of pipelines in the U.S.S.R., the Eastern Bloc countries, and the Peoples Republic of China.

Total mileage of planned and underway lines (excluding the U.S.S.R., Eastern Bloc and China lines) is up 5.7% over comparable 1978 figures, while total miles of lines under construction are down 18.5%. Interestingly, total mileage of lines planned and underway in the U.S.S.R. are also down by nearly 20%. Approximately 47% of the U.S.S.R.-Eastern Bloc-China lines are under construction while the figure is only 25% for all other international pipelines.

Natural gas lines account for 54.7% of the total international pipelines — 51,859 miles, with 9636 miles underway and 42,223 miles planned. Crude oil pipelines account for another 25.5% with 24,141 miles total and 9380 miles under construction. Products pipelines represent 17.5% with 16,504 miles total and 6836 miles being built.

Europe leads all areas with a total 17,594 miles of pipelines and 3386 miles under construction. The Middle East, which has been the hot spot for pipeline construction and planning in recent years, has a total of 16,960 miles of lines planned or underway — with 6335 miles actually being built. For Africa, a total of 9110 miles is on the books, with 3900 miles being installed. Central America and Mexico is an extremely active area — considering the region's size — with 4149 miles total and 2051 miles underway. A total of 4921 miles of pipeline planned or underway is recorded for Australia and New Zealand, with current construction totaling only 120 miles. The Southeast Asia/Pacific area totals 5629 miles, with 2769 miles being built. In South America, the 1050 miles of pipelines being installed represent only about 10% of the total 10,055 miles of planned/underway pipeline activity. And Canada, with 13,967 miles planned or underway, has a bright future even though there are only 1302 miles of pipeline currently being built.

The U.S.S.R., according to currently available information, has 12,231 miles planned/underway, with 6185 miles of pipelines under construction and with much of it to be completed in 1979 or very early 1980. The Eastern Bloc countries — Poland, Hungary, Bulgaria, Czechoslovakia, and Yugoslavia — represent 3191 total miles and 2360 miles underway. China, which is in urgent need of pipelines (see special report this issue), has plans for 3320 miles of oil and gas pipelines but nothing concrete for near future construction.

Some big projects are underway across the globe, keeping international pipeline construction firms busy, including the 787 mile, 48-in. Petroline oil pipeline across Saudi Arabia (see special report this issue), which is being paralleled by a 746 mile, 28/30-in. natural gas liquids line being built for Aramco Services Co. The Trans-Mediterranean Gas Pipeline got underway with a bang in 1979, with construction crews busy in

INTERNATIONAL PIPELINE CONSTRUCTION — BY TYPE OF LINE

(As of September 1979)

	Miles		
Type of Line	**Total***	**U/C***	**Planned***
Gas	51,859	9,636	42,223
Crude	22,091	9,380	12,711
Products	16,504	6,836	9,668
Slurry	2,226	—	2,226
TOTALS	92,320	25,852	66,468
Iran*	5,867*	3,606**	2,684*
Grand Totals	**98,547**	**28,918**	**69,152**

(*All pipeline construction in Iran suspended; not included in totals by types of line)

INTERNATIONAL PIPELINE CONSTRUCTION — BY COUNTRY

(Underway, Planned, and Proposed – September 1979) In Miles

	Miles of Gas Pipelines		Miles of Crude Oil Pipelines		Miles of Product Pipelines		Miles of Slurry Pipelines		Total Miles	
	+Total	Underway	Total	Underway	Total	Underway	Total	Underway	Total	Underway
Abu Dhabi	515	99	720	—	—	—	—	—	1235	99
Algeria	3829	965	1095	1095	596	596	—	—	5520	2656
Argentina	2127	—	—	—	12	—	—	—	2139	—
Australia	2093	24	24	—	2375	39	168	—	4660	63
Austria	226	226	—	—	—	—	—	—	226	226
Bangladesh	122	—	—	—	—	—	—	—	122	—
Belgium	109	—	—	—	93	93	—	—	202	93
Bolivia	2495	—	161	161	536	—	—	—	3192	161
Brazil	58	40	1425	645	302	—	9	—	1794	685
Bulgaria	247	247	—	—	—	—	—	—	247	247
Cameroon	—	—	2	—	—	—	—	—	2	—
Canada	10226	1129	2459	91	1282	82	—	—	13967	1302
Chad	—	—	210	210	—	—	—	—	210	210
Chile	694	—	10	—	—	—	46	—	750	—
China	1200	—	2120	—	—	—	—	—	3320	—
Colombia	548	—	1048	—	295	—	—	—	1891	—
Congo	—	—	14	—	—	—	—	—	14	—
Costa Rica	—	—	—	—	30	30	—	—	30	30
Czechoslovakia	536	536	61	61	—	—	—	—	597	597
Denmark	9308	—	—	—	—	—	—	—	9308	—
Dubai	—	—	17	—	—	—	—	—	17	—
Ecuador	316	—	6	—	505	355	—	—	827	355
Egypt	180	—	224	224	23	23	—	—	427	247
France	930	—	682	288	81	—	—	—	1693	288
Greece	70	—	50	—	—	—	—	—	120	—
Guatemala	—	—	277	—	—	—	—	—	277	—
Hungary	—	—	112	—	188	—	—	—	300	—
India	—	—	1095	504	300	—	171	—	1566	504
Indonesia	100	100	162	100	—	—	—	—	262	200
Iran	3441*	—	363*	—	2063*	1996*	—	—	5867*	3606*
Iraq	683	—	1322	—	185	—	—	—	2190	—
Ireland	—	—	—	—	—	—	—	—	—	—
Italy	967	602	—	—	67	—	342	—	1376	602
Ivory Coast	—	—	12	12	—	—	—	—	12	12
Japan	1080	—	—	—	—	—	—	—	1080	—
Kuwait	—	—	400	400	373	350	—	—	773	750
Libya	—	—	1168	436	—	—	—	—	1168	436
Malaysia	—	—	230	150	—	—	—	—	230	150
Mexico	969	666	554	554	1456	446	—	—	2979	1666
Netherlands	6	—	—	—	100	—	—	—	106	—
New Zealand	261	57	—	—	100	—	—	—	361	57
Nigeria	—	—	100	25	—	—	—	—	100	25
Norway	600	—	—	—	—	—	—	—	600	—
Oman	140	—	947	280	—	—	—	—	1087	280
Pakistan	663	—	538	390	525	525	—	—	1726	915
Panama	—	—	36	—	—	—	—	—	36	—
Peru	—	—	160	160	—	—	—	—	160	160
Poland	—	—	—	—	88	88	—	—	88	88
Portugal	—	—	—	—	69	—	—	—	69	—
Saudi Arabia	169	9	2191	838	2262	1324	—	—	4622	2171
South Africa	—	—	—	—	90	90	—	—	90	90
Spain	538	538	68	—	431	431	—	—	1037	969
Sweden	186	—	—	—	—	—	—	—	186	—
Switzerland	74	74	288	288	—	—	—	—	362	362
Tanzania	—	—	—	—	678	—	—	—	678	—
Thailand	275	—	134	—	234	—	—	—	643	—
Tunisia	304	224	—	—	—	—	—	—	304	224
Turkey	108	—	274	—	—	—	—	—	382	—
United Kingdom	447	132	263	171	355	155	—	—	1065	458
USSR	6105	4105	580	580	2006	1500	1490	—	10181	6185
Venezuela	85	—	—	—	44	44	—	—	129	44
W. Germany	1027	388	294	—	15	—	—	—	1336	388
Yemen	—	—	374	374	—	—	—	—	374	374
Yugoslavia	1253	722	706	706	—	—	—	—	1959	1428
Zaire	—	—	—	—	205	—	—	—	205	—
Zambia	—	—	—	—	380	—	—	—	380	—
Grand Total	**55300**	**10883**	**22091**	**9743**	**18567**	**8832**	**2226**	**—**	**98547**	**28918****

+ Total indicates all planned lines plus lines under construction at survey time.
** Includes 5867 miles of Iranian lines of unknown status.*
*** Includes 3606 miles of Iranian lines of unknown status.*

Automatic welding equipment, mounted on half-tracks for mobility in desert sand, makes up the firing line on the Aramco Services 746-mile, 28/30-in. natural gas liquids line being built across Saudi Arabia.

Algeria, Tunisia, Sicily, and Italy on the 1400 miles of land lines — while work is to get underway very soon on the triple-line, 100-mile crossing of the Sicilian Strait (see special report this issue) between Cape Bon and Marzaro del Vallo.

There are also some big projects on the planning boards to excite the international pipeline business. Denmark has announced plans for a $1.2-billion gas pipeline and distribution system to be completed by 1990 that will involve some 9000 miles of pipelines, ranging from small to very big, including a 131-mile offshore pipeline. Greece has acknowledged plans for a 70-mile gas line from Italy to Corfu Island, and that could lead to other gas pipelines on the Greek mainland.

Plans for a 600-mile gas pipeline from Algeria to Spain/France across the Mediterranean — the SEGAMO project — remain alive. While Norway has abandoned plans for a 125 mile oil line from Statfjord to the Norwegian coast — tankers will be used, instead, to transport the country's oil needs — there is plenty of pipeline activity ahead in the United Kingdom where a 280-mile, 42-in. gas line gets underway next year along with a 132-mile, 16-in. NGL line.

Europe

In France, Gaz de France this year will complete 252 miles of new pipelines and has an impressive 715 miles of gas pipeline planned for 1980 thru 1982. In addition, France's section of the MEGAL (Middle European Gasoline) system — 407 miles of 30 and 36-in. — is expected to be installed in 1980. Also planned is a 350-mile, 42-in. oil line from LeHavre to the Rhine River, and 81 miles of 10-in. products pipeline from Strasbourg to Lorraine.

Seven major projects are planned in West Germany, six of them natural gas, including a 30-in. line from Emden to the Danish border for Nordgas. Deurag-Nerag plans 220 miles of 12 and 20-in.; Erdgas plans 136 miles of 20-in; Gasversorgung Suddeutschland plans 92 miles of 20-in.; Ruhrgas plans 79 miles of 20 and 24-in.; and Thyssengas plans 75 miles of 20 and 24-in. A 20-in., 90-mile oil pipeline is planned by Nordeutch Oelletitungs.

In England, as previously noted, British Gas Corp. plans a fourth gas pipeline from St. Fergus receiving terminal to Bishop Aukland. The 42-in. line will tie-in with a line built in 1978 (see special report this issue). Shell also plans to build a 132-mile, 16-in. natural gas liquids line from St. Fergus to Mossmoran above Edinburgh to transport NGL received at St. Fergus from the Flags line to a new facility at Mossmoran. Several other minor pipelines now being planned are expected to be announced in early 1980.

In Italy, in addition to nearly 700 miles of 26, 30, 36, 40, 42, 46, and 48-in. pipeline being installed as part of the Trans-Mediterranean Gas Pipeline system for SNAM, there are also plans to install 42 miles of 16-in. crude line during 1980. A major pipeline development being studied for the future is a 342-mile slurry pipeline from Montefalcone to Poland.

A 69-mile, 10-in. products pipeline in Portugal is being studied by Petrosul.

In Spain, a 530-mile gas pipeline system from Barcelona to Bilbao for Enagas is being designed for 1980 construction start.

Coated and wrapped 48-in. pipe joints lie on right-of-way in shadow of Mt. Etna; they'll become part of Trans Mediterranean Gas Pipeline across Sicily, delivering Algerian gas to Italian industry and homes.

Pipelines are not a common transportation means in Greece, so it is news that Greece has studies underway to build a 60-mile undersea pipeline from Otranto, Italy, to Corfu Island, going subsea across the Strait of Otranto. Another 10 miles of land line would be required. Greece also is studying plans to build a 150-mile oil line from Korinos to Skopje, Yugoslavia.

The MEGAL system will also include 388 miles of 32 to 40-in. line in West Germany, from the Austrian border to the French border to supply gas from the U.S.S.R. to customer companies in West Germany and in France. The continuing French section, noted previously, would involve 86 miles of 36-in. from Medelsheim to Voisines, 86 miles of 30-in. from Voisines to Ervy, and 83 miles of 30-in. from Voisines to Allerex.

Norway, even though it has abandoned its 125-mile oil line from Statfjord to Sotra and the 110-mile gas line to Karmoy, is keeping alive plans to build a 600-mile large diameter pipeline to take gas from Statfjord to the European continent.

Sweden, with plans to import Algerian LNG by 1985, is also looking for gas from Denmark via an 11-mile, 24-in. gas line across Oresund Sound. Another 186 miles of 24 and 36-in. gas line from Malmo to Halstead is also planned by Swedegas.

Denmark's big $1-billion gas project to be built by the state-owned Danish Oil and Natural Gas Co., will involve a 131-mile, 36-in. offshore gas line from Cora Field to onshore (cost estimated at $210 million) plus 562 miles of 16 to 30-in. transmission lines (mostly 20-in.) and 8688 miles of 2 through 16-in. distribution lines.

Africa

Bulk of the pipeline activity in Africa is in North Africa, and, more specifically, in Algeria, where four major gas lines and a large diameter NGL line are being installed with 1980 completion dates set. Sedco is building a 317-mile, 42-in. line from Hassi R'Mel to Arzew, while NACAP B.V. is installing a 318-mile, 40-in. line along the same route, plus 124 miles of 40-in. northwest out of Hassi R'Mel to tie in with a previously built line. Bechtel is building the 350-mile 24-in. NGL line. Another 300 miles of 10 to 40-in. line are being planned in the Hassi R'Mel area. Saipem is building the 341 miles of 48-in. from Hassi R'Mel to the Tunisian border — the line that originates the vast 1700-mile Trans Mediterranean Gas Pipeline System.

In Libya, a 130-mile, 16-in. products line from Zawia to

INTERNATIONAL PIPELINE CONSTRUCTION -- BY AREAS

(Underway, Planned, and Proposed – September 1979) In Miles

	Miles of Gas Pipelines		Miles of Crude Oil Pipelines		Miles of Product Pipelines		Miles of Slurry Pipelines		Total Miles	
	*Total	Underway	Total	Underway	Total	Underway	Total	Underway	Total	Underway
Europe	14488	1960	1653	747	1111	679	342	—	17594	3386
Africa	4313	1189	2825	2002	1972	709	—	—	9110	3900
Middle East	5046	108	6608	1892	5306	4355	—	—	16960	6335
Asia, Japan & Pacific	2240	100	2159	2144	1059	525	171	—	5629	2769
Australia & N.Z.	2354	81	24	—	2375	39	168	—	4921	120
Canada	10226	1129	2459	91	1282	82	—	—	13967	1302
Central America & Mexico	1285	666	873	554	1991	831	—	—	4149	2051
South America	6007	40	2804	966	1189	44	55	—	10055	1050
SUBTOTAL	**45959**	**5273**	**19405**	**8396**	**16285**	**7244**	**736**	**—**	**82385**	**20373**
USSR	6105	4105	2630	580	2006	1500	1490	—	12231	6185
E. Bloc	2036	1505	879	767	276	88	—	—	3191	2360
China	1200	—	2120	—	—	—	—	—	3320	—
SUBTOTAL	**9341**	**5610**	**5099**	**1347**	**2282**	**1588**	**1490**	**—**	**18212**	**8545**
TOTAL	**55300**	**10883**	**24504**	**9743**	**18567**	**8832**	**2226**	**—**	**100597**	**28918**
(Iran)	—3441	—1247	— 363	— 363	—2063	—1996	—	—	—5867	—3606
Grand Total	**51859**	**9636**	**24141**	**9380**	**16504**	**6836**	**2226**	**—**	**94730**	**25852**

**Total indicates all planned lines plus lines under construction at survey time.*

Zuara is being completed by Montubi, while a 114-mile, 16 and 20-in. gas line from Zella-Aswad to Sabah continues to be planned by Occidental. For Libyan National Oil Co., Entrepose is completing a 280-mile, 18-in. oil line from Hamadat al Hamra to near Tripoli at a cost of $16 million.

Tunisia's major pipeline venture is the 224-mile, 48-in. section of the Trans Mediterranean Gas Pipeline. Another 80-mile gas line from the offshore Miskar field to Sfax is planned.

Zaire has under study a 200-mile products pipeline from Kinshasa to the interior while the Tanzania to Sambia 1060 mile products pipeline is also being studied.

Middle East

Big news in Saudi Arabia is that work is progressing on the big 787-mile, 48-in. Petroline oil pipeline from Abqaiq to Yanbu (see special report this issue) as well as on the parallel 746-mile, 28 and 30-in. natural gas liquids line for Aramco Services.

Other major work in Saudi that is underway or planned includes 408 miles of 32 and 34-in. oil line from Shaybah to Ju'aymah; 160 miles of 36 and 40-in. gas line from Uthmaniyah to Jubail; 255 miles of 24 to 42-in. gas line from Uthmaniyah to Berri; 211 miles of 28 to 40-in. NGL line from Uthmaniyah to Ju'aymah; 82 miles of 12 to 48 sour gas gathering lines and 66 miles of 3 to 12-in. NGL gathering lines near Shedgum; and 130 miles of 16 to 38-in. sour gas gathering line and 80 miles of 2 to 6-in. NGL gathering line near Uthmaniyah.

Abu Dhabi has 221 miles planned from Bultasa field to Ruwais and the 746-mile, 4 to 48-in. ZADCO system that will gather offshore and onshore oil and gas — to be built at a cost of $500 million.

Oman recently let contract for a 279-mile oil pipeline from Amal and Marmul fields to Qarn Alam to Dodsal GmbH; line is to be completed by April 1980. Other Oman projects planned include a 137-mile oil line from Amal/Marmul to Salah, a 310-mile, 20-in. line "somewhere" in Oman, a 140-mile 16 and 20-in. offshore gas line, and 201 miles of gas gathering system.

In Iraq, projects planned include a 435-mile oil and gas gathering system near Kirkuk and other northern fields; a 292-mile, 20 and 22-in. oil line from Kirkuk field to near Baghdad; a 185-mile, 8-in. LPG line from Kirkuk to Baghdad; a 775-mile, 48-in. oil line from southern Iraq to Tartus on the Mediterranean, and a 750-mile 42-in. gas line from North Rumaila to Tartus.

In Kuwait, a 400-mile gas gathering system is planned for 1980 construction.

In Turkey, a 274-mile, 24 and 26-in. oil line from Yumurtallk to Kirikkale is planned.

Iran: Question Mark

Will pipeline construction activity eventually be resumed in Iran?

It's a burning — and leading — question that is dodged publicly by those firms that were building pipelines in Iran before the political upheaval in late 1978.

It is also no secret that no pipeline work has been done since that time and that most "foreign" pipeline experts and skilled workers are now gone from Iran. Status of the many projects is indefinite. So is status of the millions of dollars of equipment owned by "foreign" contractors. It hasn't been officially expropriated, but it also has not been returned.

Iran's new government decided to halt construction of the IGAT II gas pipeline, which would have permitted gas exports from Iran to Russia, which in turn would have permitted gas exports from Russia to Europe. The 883-mile, 56-in. line was to be completed in 1981. It would have transported 600 billion cu ft per year to the U.S.S.R., who would export an equivalent amount of gas from central Russia to France, West Germany, Austria, and Czechoslovakia.

Many other oil and gas pipeline projects in Iran — 5867 miles total, including 3606 actually underway and 2684 planned — were also halted. There were also many projects that had been "completed" but not really placed in service. The total disruption is difficult to visualize, but it has occurred.

Middle East observers see no improvement in the Iranian political situation in the near future, and even greater economic woes to come. Unfortunately, many skilled Iranians — especially those knowledgeable about oil fields and gas fields and pipelines — are fleeing that country.

Welders lay in hot passes on the 48-in. pipe used on Trans Mediterranean Gas Pipeline.

International pipeline contractors have privately resolved that Iran holds no immediate future for them, and those who were working there, or held future contracts, are now seeking opportunities elsewhere.

Southeast Asia

Okinawa's newest offshore pipeline has been completed (see special report this issue).

In Thailand, the long-planned offshore/onshore gas pipeline system has not yet reached the construction stage, but is expected to get underway in late 1979 or early 1980. Involved are 275 miles of 34-in. offshore gas pipeline and 100 miles of 28-in. onshore gas line, to be built for the Natural Gas Organization of Thailand. A 234-mile, 10/12/14-in. products pipeline is also being studied in Thailand.

Malaysia plans a 36-in. gas pipeline from Luconia field to Shell's Sarawak LNG plant.

In India, Dodsal Private Ltd. is currently installing a 500-mile, 24-in. oil line from Viramgam to Mathura. A 300-mile products line from Mathura to Jullundur is also underway.

Pakistan's pipeline activity includes 500 miles of 16 and 20-in. from Karachi to Multan, to be completed in 1980. Planned by Sui Northern Gas are 478 miles of 12-in. gas gathering system and 185 miles of 1 to 6-in. gas gathering lines.

In China, some 1200 miles of gas pipelines are being studied, along with 2120 miles of crude oil pipelines, but no target dates have been announced (see special report this issue on China's gas industry).

Australia And New Zealand

Australia has a host of pipeline projects on paper — ranging from small extensions of existing lines to giant transcontinental proposals. Most likely to begin construction in 1980, if all the political obstacles can be overcome, is the 863-mile, 26-in. gas pipeline from Dampier to Perth, which will transport gas from the North West Shelf. Near Sydney, a 102-mile, 14 and 20-in. gas pipeline is getting underway for Australian Gas Light Co.

In New Zealand, completion of the Maui gas project is expected to lead to new pipeline construction as the gaseous fuel is introduced to other areas there.

Mexico And Central America

Mexico, whose expanding economy requires commensurate expansion of its oil and gas industry to provide needed energy, has embarked on a substantial pipeline expansion program. Planned and underway pipelines involved include 969 miles of gas pipeline, 554 miles of crude oil pipelines, 1760 miles of products pipelines — for a total of 2979 miles. (See special report this issue for details).

Major pipeline project in Guatemala is a 143-mile, 10 and 12-in. oil line being built by Entrepose. A planned 227-mile, 48-in. crude oil line, designed principally to handle Alaskan oil, remains on the boards.

In Panama, a 36-mile, 12-in. crude oil line across the Isthmus is planned.

South America

In Argentina, Gas del Estado's 1087 mile Central West Gas Pipeline System may get underway by the end of 1979. The $450 million project involves 700 miles of 30-in., 138 miles of 18-in., 105 miles of 12-in., and 144 miles of 8-in. The massive program will also embrace a gathering system in the Neuquin Basin.

The $1-billion, 1248-mile, 24 and 30-in. dual gas pipeline system that will be two-thirds in Brazil and one third in Bolivia continues to be planned by Petrobras and YPFB.

Bolivia's YPFB also has plans for a 405-mile gas system in that country.

Brazil's Petrobras recently awarded a $14-million contract to Williams Brothers Engineering Co. to design a 312-mile, 8 to 24-in. offshore gathering system for the Campos Basin fields some 188 miles east of Rio de Janeiro.

In Colombia, a 621-mile, 20-in. gas pipeline is being planned from Jobo-Tablon to Medellon and Cali.

Chile has a 112-mile, 30-in. gas pipeline planned to bring gas to the proposed LNG liquefaction and shipping terminal at Cabo Negro. Chile is also the site of a 40-mile, 40-in. and 10-mile, 30-in. slurry line for copper concentrate from Sewell to Callogne.

Russia, Eastern Bloc

Recent reports in the U.S. press noted that the Soviet Union will spend nearly $5.4 billion on pipelines in 1979; that includes completion of the Soyuz gas pipeline (1700 miles) with the installation of its compressor stations, and completion of the 1500-mile ammonia pipeline from Togliatti to Odessa that has been underway the past four years. Planned — and possibly underway by now — is a 2050-mile oil pipeline from Surgut to Polotsk, and a new 56-in. gas line loop from Urengoi to Chelyabinsk.

Yugoslavia's 903-mile 16 and 20-in. gas system is nearly one-half complete. 398 miles will be completed in 1979, the other 595 miles in 1980.

A 65-mile 24-in. crude line from the Adriatic through Yugoslavia to the Hungarian border is planned; local lines would be built to extend the line inside Hungary.

Czechoslovakia expects to complete during 1980 its 539 miles of 40/48/56-in. gas line that ties in with the Soyuz pipeline from the U.S.S.R.

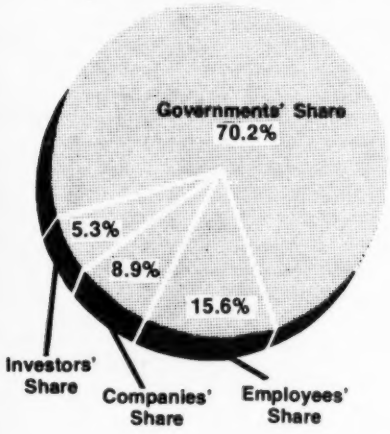
Canada

The bureaucratic tangle that has delayed for several years Canadian plans to build major gas pipelines continues to strangle activity in this nation in the upper part of North America. Canada's planning boards hold some big projects: 2032 miles of 36/42/48/56-in. for the Canadian section of the Alaska Highway Gas Pipeline Project, to be built by Foothills Pipe Lines (Yukon) Ltd.; the 2338-mile, 36 and 42-in. Polar Gas Project; the 1124-mile, 36-in. Foothills Oil Pipeline; the 710-mile Transmountain Oil Pipeline project; the 1245-mile 24-in. Q&M Pipeline project to extend gas service to the Maritimes (and the competing TransCanada PipeLine proposal to extend service to the same area).

All of the projects related to moving Alaskan oil or Alaskan gas to the U.S. through Canada require some form of approval by U.S. regulatory agencies, and that has been a firm delaying factor.

P&GJ

Beneficiaries of Integrated Oil Companies' Operations			
Employees' pay and benefits after taxes	$14.319 billion	EMPLOYEES' SHARE	15.6%
Earnings of 48 companies after dividends	$ 8.192 billion	COMPANIES' SHARE	8.9%
Dividends after taxes paid by stockholders	$ 4.823 billion	INVESTORS' SHARE	5.3%
Taxes paid by companies/investors/employees and collected from consumers	$64.331 billion	GOVERNMENTS' SHARE	70.2%
BOTTOM LINE	$91.665 billion		100.0%



Governments Take Major Share

by Ernestine Adams, *Editor, Energy Management Report*
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INCOME SHARES GENERATED BY 48 OIL COMPANIES' OPERATIONS IN 1978

Company	COMPANY'S SHARE	INVESTORS' SHARE	EMPLOYEES' SHARE	GOVERNMENTS' SHARE			
	Net income* after dividends ($000)	Dividends ($000)	Payrolls & Benefits ($000)	Taxes on dividends[1] ($000)	Taxes on employees' share[2] ($000)	Excise taxes on products[3] ($000)	Other taxes[4] ($000)	Total taxes ($000)
Adobe Oil & Gas	6,006	1,538	1,802	308	601	0	208	1,117
Amerada Hess	96,249	46,169	82,000[e]	9,234	27,333	56,000[e]	384,089	476,656
American Petrofina	8,845	23,506	74,531	4,701	24,844	59,917	15,057	104,499
Ashland Oil	176,117	68,657	526,854	13,731	175,618	259,516	213,334	662,199
Atlantic Richfield	515,810	288,515	1,016,500	57,703	338,853	440,406	631,775	1,468,717
Cities Service	32,266	85,767	440,843	17,153	146,948	170,216	182,353	516,670
Clark Oil & Refining	41,758	4,267	91,800	853	30,600	139,004	31,128	201,585
Coastal States Gas	49,850	10,393	137,620	2,119	45,827	46,300	49,000	143,246
Conoco Inc.	284,304	153,037	895,800	30,607	298,600	232,259	1,752,266	2,313,732
Crown Central Petr.	16,902	1,719	36,501	344	12,167	79,612	23,261	115,384
Crystal Oil	(1,566)	1,729	7,991	346	2,664	1,606	660	5,276
Diamond Shamrock	74,036	57,027	199,112[e]	11,405	66,371	250,000[e]	87,495	415,271
Dorchester Gas	15,031	0	7,677	0	2,559	269	5,920	8,748
Earth Resources	5,822	5,206	20,171	1,041	6,724	9,473	7,392	24,630
Exxon	1,290,760	1,472,240	3,450,000	294,448	1,135,000	3,560,532	13,955,749	18,945,729
Getty	239,437	88,314	306,390	17,663	102,130	161,993	645,926	927,712
Gulf Oil	420,000	371,000	1,345,000	74,200	448,333	1,823,000	1,666,000	4,011,533
Holly Corp.	7,151	0	8,000[E]	0	2,667	6,000[E]	6,000[E]	14,667
Husky Oil Ltd.	44,027	11,433	74,713	2,287	24,904	53,000[e]	35,936	116,127
Kerr-McGee Corp.	85,876	32,320	224,000	6,464	74,667	104,400	130,634	316,165
Louisiana Land & Expl.	54,017	46,335	60,153	9,267	20,051	0	112,842	142,160
Mapco Inc.	20,784	23,509	79,000	4,702	26,333	2,783	40,005	73,823
Marathon Oil	130,611	66,456	295,568	13,291	98,523	395,298	629,098	1,136,210
Mobil Corp.	670,015	455,623	2,325,852[e]	91,125	775,284	1,948,048	6,548,459	9,362,896
Murphy Oil	36,657	9,932	82,673	1,986	27,558	186,530	113,683	329,557
Marion Corp.	7,133	732	6,190[e]	146	2,063	5,745[e]	3,802	11,756
Occidental Petr.	(112,765)	119,465	697,240	23,893	232,413	3,432	834,372	1,094,110
Pacific Resources	1,584	7,884	14,150	1,577	4,717	0	7,138	13,432
Pennzoil Co.	57,755	70,412	185,660	14,082	61,887	28,327	109,966	214,262
Phillips Petroleum	525,694	184,785	720,489	36,957	240,163	176,000	1,117,363	1,570,483
Quaker State	9,921	15,424	88,045	3,085	29,348	9,489	20,225	62,147
Reserve Oil & Gas	10,134	6,666	35,000	1,333	11,667	32,719	10,831	56,550
Shell Oil	545,990	267,633	1,051,000	53,527	350,333	886,680	779,568	2,070,108
Southern Union Co.	8,622	13,425	39,000	2,685	13,000	1,305	19,244	36,234
Standard California	671,300	434,581	994,000	86,916	331,333	873,184	1,864,071	3,155,504
Standard Indiana	666,451	409,961	1,126,731	81,992	375,577	1,177,700	1,876,500	3,511,769
Standard Ohio	359,611	90,594	431,998	18,119	143,999	287,678	378,461	828,257
Sun Co.	211,477	140,864	769,580	28,173	256,527	486,135	591,264	1,362,099
Tenneco Inc.	207,000	227,900	1,200,000[e]	45,580	400,000	200,000[e]	186,000	831,580
Tesoro Petroleum	21,628	9,535	54,757	1,907	18,246	16,800	18,441	55,394
Texaco Inc.	309,553	542,908	1,572,800	108,582	524,267	2,631,320	2,781,600	6,045,769
Tipperary Corp.	(1,755)	0	2,413	0	804	0	1,133	1,937
Texas American Oil	3,336	5% stock	1,800[e]	0	600	0	1,448	2,048
Texas Eastern Corp.	82,277	54,929	108,673	10,986	36,224	0	149,575	196,785
Tosco Corp.	15,422	0	71,506	0	23,835	133,032	9,893	166,760
Total Petroleum (N.A.)	14,510	2,306	28,101	461	9,367	18,185	10,000	38,013
Union California	279,499	102,785	444,900	20,557	148,300	384,700	519,100	1,072,657
United Refining	6,684	1,147	22,000	229	7,333	66,267	25,080	98,909
TOTAL	8,191,608	6,028,826	21,456,564	1,205,765	7,137,142	17,404,660	38,583,305	64,330,872

[1]Taxes on dividends are 1/3, up from 1/6 used in 1976 and 1975 because inflation increases tax without a rate increase. [2]Employees' taxes are estimated at 1/3, calculated by Taxpayers' Foundation as the average rate for employeed persons. [3]U.S. federal excise tax 4¢/gal. in 1978; state taxes averaged about 8¢/gal. Other products have lower excise tax. [4]Taxes levied directly on companies: income taxes (before dividends), property taxes, severance taxes on oil/gas production, sales tax on goods purchased, tariffs. *Excluding non-recurring items. [E]Estimate. [e]Our estimate.

The fourth year for this table shows governments – USA and foreign, local and national – take more than 70% of the funds paid to 48 oil companies in their operations.

This estimate of governments' share is very conservative. Every time an oil company buys equipment, services and supplies it adds to governments' revenues.

All firms selling to petroleum companies pay taxes at every government level; their stockholders pay sales, income, property, school and any other taxes levied by various government levels in the USA and other countries.

Although purchases of services, equipment and supplies are usually the largest portion of oil company expenses, these are not included in this particular table.

Compared with last year only the employees' percentage share of funds generated by oil companies has increased. Companies' earnings, investors' dividends and governments' share are all virtually the same.

All figures are higher but not enough to balance inflation.